IN THE CLAIMS

The following is a complete listing of the pending claims:

Claims 1-33 (canceled).

34. (currently amended) A method for processing a spread spectrum signal, comprising ~~The method of claim 33, wherein~~:

receiving a code modulated spread spectrum signal;

generating a code modulated signal replica of the received signal;

correlating the received signal with a first code phase delayed replica to generate an early correlation product;

correlating the received signal with a second code phase delayed replica to generate a prompt correlation product;

correlating the received signal with a third code phase delayed replica to generate a late correlation product;

detecting a relative magnitude of and a sign of a multipath error in the received signal based on at least one relationship between an amplitude of the early correlation product, an amplitude of the prompt correlation product and an amplitude of the late correlation product; wherein determining the sign of the multipath error comprises comparing a ratio of the amplitude of the prompt correlation product to an equal amplitude of the early and late correlation products, wherein the early and late correlation products are offset symmetrically from the prompt correlation product;

determining that a lag error exists when the amplitude of the prompt correlation product is less than twice the equal amplitude;

determining that a lead error exists when the amplitude of the prompt correlation product is more than twice the equal amplitude; and

determining that no multipath error exists if the amplitude of the prompt correlation product is equal to twice the equal amplitude.

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35. (currently amended) A method for processing a spread spectrum signal, ~~The method of claim 32, further comprising,~~ comprising:

receiving a code modulated spread spectrum signal;

generating a code modulated signal replica of the received signal;

correlating the received signal with a first code phase delayed replica to generate an early correlation product;

correlating the received signal with a second code phase delayed replica to generate a prompt correlation product;

correlating the received signal with a third code phase delayed replica to generate a late correlation product;

detecting a relative magnitude of and a sign of a multipath error in the received signal based on at least one relationship between an amplitude of the early correlation product, an amplitude of the prompt correlation product and an amplitude of the late correlation product; wherein determining the sign of the multipath error comprises comparing a ratio of the amplitude of the prompt correlation product to an equal amplitude of the early and late correlation products, wherein the early and late correlation products are offset symmetrically from the prompt correlation product; and

~~when~~ if the relative magnitude of the multipath error is determined to be below a predetermined value, determining a correction to a pseudorange calculation, wherein the correction is proportional to a sum of the amplitudes of the early correlation product and the late correlation product divided by the prompt correlation product.

Claims 36 – 37. (cancelled)

38. (currently amended) ~~The method of claim 30, further~~ A method for processing a spread spectrum signal, comprising:

receiving a code modulated spread spectrum signal;

generating a code modulated signal replica of the received signal;

correlating the received signal with a first code phase delayed replica to generate an early correlation product;

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correlating the received signal with a second code phase delayed replica to generate a prompt correlation product;

correlating the received signal with a third code phase delayed replica to generate a late correlation product;

detecting a relative magnitude of and a sign of a multipath error in the received signal based on at least one relationship between an amplitude of the early correlation product, an amplitude of the prompt correlation product and an amplitude of the late correlation product; and

using the multipath error to generate a control signal to control a phase relationship between respective early and late correlation products and further to control a relationship of the prompt correlation product with respect to the early correlation product and the late correlation product.

Claims 39 – 45. (cancelled)

46. (currently amended) ~~The apparatus of claim 45,~~ An apparatus for receiving a signal, the apparatus comprising:

a receiver configured to receive a signal comprising a PN code;

a code generator coupled to the receiver, the code generator configured to generate a PN code replica of the received signal;

an error detector coupled to the receiver and to the code generator, wherein the error detector detects code phase error in the received signal based on detecting at least one of:

power of a first correlation product of an early code phase delayed version of the code replica and the received signal, a second correlation product of a prompt code phase delayed version of the code replica and the received signal, and a third correlation product of a late code phase delayed version of the code replica and the received signal;

phase of respective first, second and third correlation products; and

quadrature of respective first, second and third correlation products, the apparatus further comprising:

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a code phase error detector coupled to the at least one detector and configured to determine a sign of the code phase error and a relative magnitude of the code phase error, wherein determining a sign of the code phase error comprises the code phase error detector comparing a ratio of the amplitude of the second correlation product to an equal amplitude of the first and third correlation products, wherein the first and third correlation products are offset symmetrically from the second correlation product; and

wherein the code phase error detector is further configured to:

determine that a lag error exists when the amplitude of the second correlation product is less than twice the equal amplitude;

determine that a lead error exists when the amplitude of the second correlation product is more than twice the equal amplitude; and

determine that no code phase error exists if the amplitude of the second correlation product is equal to twice the equal amplitude.

47. (currently amended) ~~The apparatus of claim 44,~~ An apparatus for receiving a signal, the apparatus comprising:

a receiver configured to receive a signal comprising a PN code;

a code generator coupled to the receiver, the code generator configured to generate a PN code replica of the received signal;

an error detector coupled to the receiver and to the code generator, wherein the error detector detects code phase error in the received signal based on detecting at least one of:

power of a first correlation product of an early code phase delayed version of the code replica and the received signal, a second correlation product of a prompt code phase delayed version of the code replica and the received signal, and a third correlation product of a late code phase delayed version of the code replica and the received signal;

phase of respective first, second and third correlation products; and

quadrature of respective first, second and third correlation products, the apparatus further comprising:

a code phase error detector coupled to the at least one detector and configured to determine a sign of the code phase error and a relative magnitude of the code phase error,

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wherein the code phase error detector is further configured to determine a correction to a pseudorange calculation when the relative magnitude is determined to be below a predetermined value, wherein the correction is proportional to a sum of the amplitudes of the first correlation product and the third correlation product divided by the second correlation product.

Claim 48. (cancelled)

49. (currently amended) An apparatus for receiving a signal, the apparatus comprising: ~~The apparatus of claim 41, further comprising~~

a receiver configured to receive a signal comprising a PN code;

a code generator coupled to the receiver, the code generator configured to generate a PN code replica of the received signal;

an error detector coupled to the receiver and to the code generator, wherein the error detector detects code phase error in the received signal based on at least one relationship between a first correlation product of an early code phase delayed version of the code replica and the received signal, a second correlation product of a prompt code phase delayed version of the code replica and the received signal, and a third correlation product of a late code phase delayed version of the code replica and the received signal; and

an adjustable delay element coupled to the code generator and further coupled to the code phase error detector to receive a code phase error signal, wherein the at adjustable delay element is configured to use the code phase error signal to adjust a phase of the PN code replica such that phases of respective first, second and third correlation products are adjusted.

50. (currently amended) An apparatus for receiving a signal, the apparatus comprising: ~~The apparatus of claim 41, further comprising~~

a receiver configured to receive a signal comprising a PN code;

a code generator coupled to the receiver, the code generator configured to generate a PN code replica of the received signal;

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an error detector coupled to the receiver and to the code generator, wherein the error detector detects code phase error in the received signal based on at least one relationship between a first correlation product of an early code phase delayed version of the code replica and the received signal, a second correlation product of a prompt code phase delayed version of the code replica and the received signal, and a third correlation product of a late code phase delayed version of the code replica and the received signal; and

at least one delay element coupled to at least one correlator and further coupled to the code phase error detector, wherein the at least one delay element is configured to use the code phase error signal to generate a control signal to control a phase relationship between respective first and third correlation products and further to control a relationship of the second correlation product with respect to the first correlation product and the third correlation product.

Claims 51 – 57. (cancelled)

58. (currently amended) An apparatus for processing global positioning system (GPS) satellite signals, the apparatus comprising: ~~The apparatus of claim 57,~~

receiver means for receiving a GPS signal;

code generator means for generating a PN code replica of the received GPS signal;

multipath error detector means for detecting a multipath error in the received GPS signal based on detecting at least one of:

power of a first correlation product of an early code phase delayed version of the code replica and the received signal, a second correlation product of a prompt code phase delayed version of the code replica and the received signal, and a third correlation product of a late code phase delayed version of the code replica and the received signal;

phase of respective first, second and third correlation products; and

quadrature of respective first, second and third correlation products,

wherein the multipath error detector means is further configured to:

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determine that a lag error exists when the amplitude of the second correlation product is less than twice the equal amplitude;

determine that a lead error exists when the amplitude of the second correlation product is more than twice the equal amplitude; and

determine that no multipath error exists if the amplitude of the second correlation product is equal to twice the equal amplitude.

Claims 59 -- 60. (cancelled)

61. (currently amended) An apparatus for processing global positioning system (GPS) satellite signals, the apparatus comprising: ~~The apparatus of claim 54, further comprising~~

receiver means for receiving a GPS signal;

code generator means for generating a PN code replica of the received GPS signal;

multipath error detector means for detecting a multipath error in the received GPS signal based on at least one relationship between a first correlation product of the received GPS signal with a first PN code phase delayed replica, a second correlation product of the received GPS signal with a second PN code phase delayed replica, and a third correlation product of the received GPS signal with a third PN code phase delayed replica; and

an adjustable delay means coupled to the code generator means and further coupled to the multipath error detector means to receive a multipath error signal, wherein the at adjustable delay element is configured to use the multipath error signal to adjust a phase of the PN code replica such that phases of respective first, second and third correlation products are adjusted.

62. (currently amended) An apparatus for processing global positioning system (GPS) satellite signals, the apparatus comprising: ~~The apparatus of claim 54, further comprising~~

receiver means for receiving a GPS signal;

code generator means for generating a PN code replica of the received GPS signal;

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multipath error detector means for detecting a multipath error in the received GPS signal based on at least one relationship between a first correlation product of the received GPS signal with a first PN code phase delayed replica, a second correlation product of the received GPS signal with a second PN code phase delayed replica, and a third correlation product of the received GPS signal with a third PN code phase delayed replica; and

at least one delay means coupled to at least one correlator and further coupled to the multipath error detector means, wherein the at least one delay means is configured to use the multipath error signal to generate a control signal to control a phase relationship between respective first and third correlation products and further to control a relationship of the second correlation product with respect to the first correlation product and the third correlation product.

Claims 63 – 64. (cancelled)

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